

REMARKS

The Office Action of September 25, 2006 has been received and its contents carefully considered.

The Office Action again rejects independent claims 1, 2, and 37 (along with various dependent claims) for obviousness based on Urushima in view of Ohsawa et al (hereafter simply "Ohsawa"), and provides additional comments in a "Response to Arguments" section. The rejections are respectfully traversed.

With regard to claim 1, the Office Action characterizes the left and right side portions of Urushima's heat radiation paste 30 as the "first heat radiating film" of claim 1, and a central portion of Urushima's paste 30 as the "second heat radiating film" of claim 1. However, claim 1 recites that the first heat radiating film is disposed on the substrate, while the second heat radiating film is disposed on a semiconductor device that is mounted on the substrate. The natural result of this geometry is that the first and second heat radiating films of claim 1 are located at different heights. In contrast, the various portion of Urushima's heat radiation paste 30 are all located at the same height.

Furthermore, the passage at column 18 of Urushima, lines 17-20 states that:

...heat spreader 32 is bonded to the back of semiconductor devices 3 through heat radiation pastes 12. Such a configuration can result in a multi chip module with a high level of heat radiation.

From this, an ordinarily skilled person would understand that Urushima's heat radiation paste 30 is only present in order to transfer heat to Urushima's heat spreader 32, which is essential in Urushima's scheme for dissipating heat from a multi-chip module. There is no conception, in Urushima, of omitting the heat spreader 30 while leaving the paste 30. That is, an ordinarily skilled person would not have had any motivation to delete Urushima's heat

spreader 32 and expose the rear side of the paste 30 to air in order to obtain better heat dissipation.

The Office Action acknowledges that Urushima does not disclose a second heat radiating film (that is, Urushima's heat radiating paste 30) having a rear side that is exposed to air. For this, the Office Action turns to Ohsawa's heat radiating plate 18. However, claim 1 provides that the second heat radiating film "does not extend beyond the periphery of the second surface" of the semiconductor device. Ohsawa's heat radiating plate does extend beyond the top surface of his chip 2 (Ohsawa's reference number 19 simply identifies holes in the heat radiating plate 18; see column 7, lines 23-29). So even replacing Urushima's heat spreader 32 with Ohsawa's plate 18 would not result in the invention defined by claim 1.


Turning now to independent claim 2, this claim provides that a heat radiating film is disposed on a second surface of a semiconductor device without extending beyond the periphery of the second surface, and that the heat radiating film has peripheral edge and a rear side that are exposed to air. This is not true of Urushima's heat radiation paste 30. Nor would modifying Urushima in accordance with Ohsawa result in what is claimed, as discussed above.

Independent claim 37 recites first and second heat radiating films. The claim provides that a second heat radiating film is disposed on a second surface of a semiconductor device without extending beyond the periphery of the second surface, and that the second heat radiating film has a peripheral edge and a rear side that are exposed to air. For reasons along the lines discussed above with respect to claims 1 and 2, it is respectfully submitted that this is not suggested by the references.

The remaining claims depend from the independent claims discussed above and recite additional limitations to further define the invention. They are therefore patentable along with their independent claims and need not be further discussed.

For the foregoing reasons, it is respectfully submitted that this application is in condition for allowance. Reconsideration of the application is respectfully requested.

Respectfully submitted,

A handwritten signature in cursive script that reads "Allen Wood". The signature is written in dark ink and is positioned above a horizontal line.

Allen Wood
Registration No. 28,134
Rabin & Berdo, P.C.
Customer No. 23995
(202) 326-0222 (telephone)
(202) 408-0924 (facsimile)

AW/ng